

## **REMARKS**

### **STATUS OF CLAIMS**

Claims 1-12 are presently pending in the application. Claim 1 is the sole independent claim. Claim 1 has been amended here in part to overcome a formal objection by the Examiner, and in part to obviate a rejection below. The amendment finds support in the originally-filed application at, among other places, paragraph [0014]. Reconsideration and allowance are requested.

### **Rejection Under 35 U.S.C. §103(a) Based on Armstrong**

Claims 1-4, 6-9 and 12 are rejected under 35 U.S.C. § 103(a) based on Armstrong (US Pat. No. 5,565,891, "Armstrong") in view of Nippoldt (US Pat. No. 4,952,919, "Nippoldt"). Claim 5 is rejected under 35 U.S.C. § 103(a) based on Armstrong in view of Nippoldt and further in view of Blonder (US Pat. No. 5,620,371, "Blonder"). Claim 10 is rejected under 35 U.S.C. § 103(a) based on Armstrong in view of Nippoldt and further in view of Bruneau et al. (US Pat. No. 6,707,443, "Bruneau"). Claim 11 is rejected under 35 U.S.C. § 103(a) based on Armstrong in view of Nippoldt and further in view of Keyson (US 6,784,052, "Keyson"). These rejections are respectfully traversed for the following reasons.

With regard to the rejection of the independent claim 1 based on Armstrong and Nippoldt, Applicants note that the Armstrong reference was mentioned and discussed in detail in the current specification. In Armstrong, a hand-manipulated six-degree-of-freedom controller is shown. A partially-exposed freely-rotatable trackball within a carriage is movable in all linear directions relative to a stationary housing. The controller includes the housing supporting the movable carriage, with the carriage supporting the trackball. The carriage is movably retained for allowing linear movement of the carriage and thus of the trackball along the three mutually-perpendicular axes, independent of the housing. A portion of the carriage or the trackball is exposed to allow manual manipulation of the carriage position. This exposed portion of the trackball is available for grasping with the fingers to apply force in any linear direction, much like a basketball player grasps a basketball in one hand or in the fingers.

The Nippoldt reference teaches a trackball-type input device with a retainer to secure a ball to a housing so that a large segment of the ball protrudes from the housing for manipulation

by the user. The large segment of the ball is exposed for grasping between a user's thumb and finger. More particularly, the ball is rotatably mounted in a housing that is configured so that more than half of the ball surface area protrudes above the housing. The retainer is sized to secure the ball, while permitting the ball to be grasped at diametrically-opposed portions of the ball surface. Accordingly, a user can precisely control the fine rotational motion of the ball. The trackball mechanism is particularly useful when three motion detectors are employed to detect motion of the ball about three orthogonal axes.

Armstrong is put forth for an alleged teaching of virtually all the elements of the claim, excepting teaching where the operating ball is mounted within the retaining element such that it may be grasped on two at least partially diametrically-opposed sphere segment sections, and wherein the displacement forces and the rotation forces with respect to all axes may be exerted by means of the operating ball. Nippoldt is set forth for alleging teaching these missing elements, and the Examiner alleges that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the input device taught by Armstrong with the teachings of Nippoldt to form an input device in which more precise control of the rotation of the operating ball may be achieved.

As discussed below, Applicants submit that the Examiner has failed to set forth a *prima facie* case of obviousness, and even assuming, *arguendo*, that a proper *prima facie* case has been set forth, even the combination is deficient to render the claims obvious.

As noted in MPEP 2142:

To reach a proper determination under 35 U.S.C. 103, the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search and evaluate the "subject matter as a whole" of the invention. The tendency to resort to "hindsight" based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

In the present case, the person of ordinary skill in the art would be a college-trained engineer with a background in electrical engineering or mechanical engineering, with some experience in manually-operated data registration devices. To arrive at the current invention, giving the Examiner's points the benefit of the doubt, such a person of ordinary skill may start at the controller shown by Armstrong. This controller presents particular difficulties during registration of displacement data along the z-axis, i.e., perpendicular to the main plane of the device, i.e., the x-y plane. In order to register z-displacements, one's hand must move from the operating ball to the ball carrier. Applicants submit it may be possible to exert force on the operating ball in one z-direction, but displacement of the operating ball in the opposite z-direction is not possible as the operating ball cannot be adequately securely held. One of ordinary skill in the art, i.e., the college-trained engineer, would not then look to the Nippoldt reference to solve this problem since the engineer would quickly realize that Nippoldt does not disclose a displaceable device, rather, it is only rotatable. Nippoldt would not then solve the problem remaining from the Armstrong device. As the two references would not be thus combined by the person of ordinary skill in the art, Applicants submit that the combination fails to provide a *prima facie* case of obviousness and that the rejections of the claims based on this combination should be withdrawn.

However, even assuming, *arguendo*, that the two were properly combinable, Applicants submit that even the combination is insufficient to render obvious the claimed invention. That is, Nippoldt could not provide what is missing in Armstrong. In this regard the Examiner is reminded of the requirements of MPEP 2143.03.

2143.03 All Claim Limitations Must Be "Considered" [R-6] - 2105 Patentability

2143.03 All Claim Limitations Must Be "Considered" [R-6]

"As it seems to a claim must be considered in judging the patentability of that claim against the prior art" is re Woburn, 424 F.2d 1202, 1365, 195 USPQ 454, 456 (CCPA 1970). If an independent claim is unobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 657 F.2d 1274, 5 USPQ2d 1596 (9th Cir. 1980).

In particular, Applicants submit that the Examiner has not considered all the words in the claim. Applied to the instant facts, Applicants note that Nippoldt does not concern an operating ball that is rotatable about three axes and that is simultaneously displaceable along three axes. Nippoldt's trackball is only *rotatable* about three axes, not *displaceable*. Consequently, there is no sensor with which to measure such a displacement. Therefore, the Examiner's point that Nippoldt discloses that "*displacement forces* and the rotation forces with respect to all axes may be exerted by means of the operating ball" is respectfully submitted to be inaccurate. Put

another way, Applicants note that the Examiner alleges that the person of ordinary skill in the art would have used Nippoldt's teaching to form an input device in which more precise control of the rotation of the operating ball could be achieved. However, according to the claimed invention, what is achieved is a *displacement* of the operating ball, not necessarily more precise control of *rotation*.

To summarize, the combination of Armstrong with Nippoldt sets forth an improper *prima facie* case of obviousness, and even the combination of Armstrong with Nippoldt is insufficient to render obvious the claimed invention. Consequently, Applicants submit that the rejection of independent claim 1 based on the combination of Armstrong and Nippoldt should be withdrawn.

The remaining claims, all dependent from claim 1, are submitted to be allowable for even more reasons as they require additional elements. Certain examples are provided below.

Claim 5 requires that the operating ball is mounted magnetically within the key-shaped mount, and further that the operating ball is hollow and is made of a non-magnetic material. A magnetizable retaining ball is mounted within the operating ball so that it may move freely, and a magnetic field source, positioned outside the operating ball, attracts the retaining ball into the key-shaped ball mount. The operating ball is mounted in the ball mount such that it may rotate. No such system is disclosed in Armstrong or Nippoldt. With regard to the teachings of Blonder, the Examiner suggests that "a magnetizable retaining ball is mounted within the operating ball so that it may move freely, and wherein a magnetic field source positioned outside the operating ball *attracts the retaining ball into the key-shaped ball mount*". Applicants respectfully submit that it is clear from the Blonder disclosure that the magnetic field source is not related to attracting the retaining ball into the key-shaped ball mount. Rather, it is implicit in Blonder that merely standard techniques for holding the ball in place are employed. See, e.g., column 3, lines 28-32. The magnetic aspects of Blonder are used to orient the inner ball in a particular position so that an advertisement or other logo is consistently showing to the user – not to hold the ball in place.

Thus, Applicants submit that the rejection of claim 5 based on the combination of Blonder with Armstrong/Nippoldt is improper and is insufficient to render obvious the claimed invention. Consequently, Applicants request the rejection of claim 5 be withdrawn for at least these reasons.

Regarding claim 10, the Examiner cites the Bruneau reference for an alleged teaching of optical sensors that sample a surface of the operating ball and its rotation. In this regard the Examiner is reminded of the requirements of MPEP 2143.01:

**V. THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE**

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (Claimed device was a blood filter assembly for use during medical procedures wherein both the inlet and outlet for the blood were located at the bottom end of the filter assembly, and wherein a gas vent was present at the top of the filter assembly. The prior art reference taught a fluid strainer for removing dirt and water from gasoline and other liquid wherein the inlet and outlet were at the top of the device, and wherein a pet-cock (stopcock) was located at the bottom of the device for periodically removing the collected dirt and water. The reference further taught that the separation is assisted by gravity. The Board concluded the claims were *prima facie* obvious, reasoning that it would have been obvious to turn the reference device upside down. The court reversed, finding that if the prior art device was turned upside down it would be inoperable for its intended purpose because the gasoline to be filtered would be trapped at the top, the water and heavier oils sought to be separated would flow out of the outlet instead of the purified gasoline, and the screen would become clogged.)

"Although statements limiting the function or capability of a prior art device require fair consideration, simplicity of the prior art is rarely a characteristic that weighs against obviousness of a more complicated device with added function." *In re Danco*, 180 F.3d 1339, 1344, 48 USPQ2d 1835, 1838 (Fed. Cir. 1998) (Court held that claimed catheter for removing obstruction in blood vessels would have been obvious in view of a first reference which taught all of the claimed elements except for a "means for recovering fluid and debris" in combination with a second reference describing a catheter including that means. The court agreed that the first reference, which stressed simplicity of structure and taught emulsification of the debris, did not teach away from the addition of a channel for the recovery of the debris.)

Applied to the instant facts, Applicants concur that Bruneau teaches optical sensors. However, clearly Bruneau is not properly combinable with Nippoldt because Nippoldt in part renders Bruneau unsatisfactory for its intended purpose. In particular, due to the lack of surface contact of the operating ball in Nippoldt with the base or lower surface of the housing 12, Nippoldt employs a retainer 114 which extends almost to the top of the operating ball 80 in order to hold the ball in place. The user then contacts and controls the ball as shown in Fig. 1. This is clearly antithetical to the trackball device of Bruneau, which transmits its haptic forces along various directions including the z-direction. While some haptic or tactile forces may be felt by a user of the Nippoldt device, most forces, no matter the direction, would simply be dampened or dissipated by the retainer 114. Consequently, one of ordinary skill in the art would not combine the two references since the devices in part would work against each other.

With regard to claim 11, Keyson does not appear to provide much more than that provided by the other references. Rather, Keyson provides a drive means for tactile feedback, but not actuators that oppose or reinforce a varying force in reaction to control signals from the user resulting from displacement of the retainer element or rotation of the operating ball.

For at least these reasons, Applicants respectfully submit that the claims of the invention discussed above are patentable over the cited references. Given the above remarks and the amendments to the claims, Applicants submit that the Examiner's rejections under 35 U.S.C §103(a) have been obviated and Applicant respectfully requests that the Examiner withdraw the rejections.

**CONCLUSION**

Applicants submit that all pending claims are in condition for allowance, early notification of which is earnestly solicited. Should the Examiner be of the view that an interview would expedite consideration of this Response or of the application at large, the Examiner is requested to telephone the Applicants' attorney at the number listed below in order to resolve any outstanding issues in this case.

**FEES**

Any fees deemed to be due or credit for any overpayment for this application should be directed to Deposit Account Number 50-1047 and authorization is hereby given to charge such account.

Respectfully submitted,

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